

Claims

What is claimed is:

1. A method for high-resolution (high-res) location of an object in an image using a single-chip color image sensor that is sensitive to N bands of electromagnetic energy, the sensor having a sensor geometry, comprising:
 - providing a high-res color model of an object;
 - acquiring a color image of an object with the color image sensor;
 - finding an alignment location of the high-res color model in the color image so as to provide a single low-res location;
 - using the phase of the single low-res location, and using the sensor geometry, so as to provide a true-phase high-res color model having correct phase; and
 - finding a high-res location of the true-phase high-res color model in the acquired color image.
2. The method of claim 1, wherein finding the alignment location of the high-res color model in the color image includes:
 - providing N low-res single-band locations, one low-res single-band location for each of the N bands; and
 - combining the N low-res single-band locations into a single low-res location.

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2 3. The method of claim 2, wherein combining the N low-res single-band locations

3 includes:

4 combining the N low-res single-band locations into a single low-res location
5 using a weighted sum, each location being associated with a weighting factor.

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7 4. The method of claim 3, wherein the weighting factor includes a confidence factor.

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9 5. The method of claim 1, wherein the sensor geometry is based on the Bayer
10 pattern.

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12 6. The method of claim 1, wherein providing a high-res color model of an object
13 includes:

14 creating a high-res synthetic model of the object.

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16 7. The method of claim 1, wherein providing a high-res color model of an object
17 includes:

18 acquiring a high-res image of the object using a high-res camera.

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20 8. The method of claim 1, wherein providing a high-res color model of an object
21 includes:

22 acquiring a low-res image at each phase inherent in the sensor geometry.

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9. The method of claim 1, where N is 3, and the bands represent red, green, and blue.

10. The method of claim 1, wherein using the phase of the single low-res location, and using the sensor geometry, so as to provide a true-phase high-res color model having correct phase includes:

selecting one of N candidate high-res color models by using the phase of the single low-res location.

11. The method of claim 1, wherein using the phase of the single low-res location, and using the sensor geometry, so as to provide a true-phase high-res color model having correct phase includes:

synthesizing a synthetic model.